

## ABSTRACT

A stage assembly and support system are provided to stabilize a stage base, such as a wafer stage base or a reticle stage base, minimizing forces transmitted from the stage assembly to a stationary surface, such as the ground, and thereby preventing 5 vibration of other parts or systems in a wafer manufacturing process. Depending of the applicable photolithography system, a reticle stage and/or a wafer stage are accelerated in response to a wafer manufacturing control system to position the semiconductor substrates. The jerking motions of the reticle stage and/or wafer stage cause reaction forces acting on the reticle stage base and/or wafer stage base. The 10 reaction forces induce vibration to the stationary surface and surrounding parts of the photolithography system. The wafer stage assembly and support system according to this invention allow the reticle stage base and/or wafer stage base to move relative the stationary surface. The base, acting as a massive reaction mass, stores a kinetic energy from the reaction force and gradually dissipates such energy by applying small 15 forces to the reaction mass. The stage assembly and support system according to this invention are also capable of canceling any disturbance forces acting on the base.